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| APPLICATION NO.                                     | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/823,196  | 03/30/2001  | Thomas H. Baum       | 510                 | 1232             |
| 25559   | 7590        | 04/13/2004           | EXAMINER            |                  |
| ATMI, INC.<br>7 COMMERCE DRIVE<br>DANBURY, CT 06810 |             |                      | KIELIN, ERIK J      |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2813                |                  |

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |                       |
|------------------------------|-----------------|-----------------------|
| <b>Office Action Summary</b> | Application No. | Applicant(s)          |
|                              | 09/823,196      | BAUM ET AL. <i>OK</i> |
|                              | Examiner        | Art Unit              |
|                              | Erik Kielin     | 2813                  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 February 2004.  
 2a) This action is FINAL. 2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-3,8-12,16,37 and 87-91 is/are pending in the application.  
 4a) Of the above claim(s) 87-91 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-3,8-12,16 and 37 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

This action responds to the Amendment filed 4 February 2004.

***Election/Restrictions***

1. Newly submitted claims 87 through 91 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The molecular formula in claim 87 is different from the formulas in independent claims 1 and 37 and all of the species already considered.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 87 through 91 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Cancellation of the following claims in this or previous Amendments is acknowledged: claims 4-7, 13-15, 17-36, and 38-86.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 1-3, 8-12, 16, and 37 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 1 and 37 recite the limitation, “x and y are different amino ligands.”

This terminology is unclear in scope because x and y are **not** ligands themselves but are subscripts in a molecular formula denoting the **number** of ligands of the amino group directly to the left of the subscript. Accordingly, the claims as presently written could mean (1) the broadest interpretation, that the ligands are inherently not the same since no two atoms are the same even if they are both of the same element (i.e. one nitrogen is not a second nitrogen, even though both are nitrogen); (2) that the number of ligands x and y are different, when  $R_2$  and  $R_2'$  are different; or (3) that x and y may be the same number, when  $R_2$  and  $R_2'$  are different.

For the purposes of patentability, the claims will be given their broadest reasonable interpretation, as in (1) above.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 11, 12, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,583,205 (**Rees, Jr.**).

Regarding claims 1 and 37, **Rees** discloses a CVD (chemical vapor deposition) precursor composition for forming a thin film dielectric on a substrate, including at least one metalloamide source reagent compound, or a vapor source reagent mixture including a metalloamide source reagent compound, having the formula

$M(NR_1R_2)_x(NR_1'R_2')_y$  (col. 5, line 20; col. 6, line 45)

wherein M is a metal selected from Li, Zn, La, lanthanide and actinide series elements (called the “F-series”), (Abstract; col. 6, lines 27-30; col. 7, Table 1); N is nitrogen; each of R<sub>1</sub>, R<sub>2</sub>, R'<sub>1</sub>, and R'<sub>2</sub> is the same or different and is independently selected from of alkyl, alkenyl, aryl, C<sub>1</sub>-C<sub>8</sub> alkyl, alkylsilyl (col. 3, lines 24-43; col. 5, lines 1-28); and x is form 1 to 5 and y and from 1 to 5 and x+y is the oxidation state of metal M. The amino ligands are inherently different because there are more than one of them complexed to the metal. Even if the amino ligands are identical in elemental make-up, they are still “different” as two atoms or groups of atoms cannot be one and the same atom or groups of atoms. (See also col. 6, lines 6-56.)

Regarding claims 2 and 3, each of R<sub>1</sub>, R<sub>2</sub>, R'<sub>1</sub>, and R'<sub>2</sub> may be methyl or ethyl (col. 3, lines 24-43; col. 5, lines 1-28).

Regarding claims 11 and 12, the means by which the CVD precursor may be delivered to the CVD chamber is an intended method of using of the composition and does not have patentable weight in the instant claims drawn to composition. (See MPEP 2112.01 and 2112.02.)

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 8-10, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Rees** in view of US 6,159,855 (**Vaartstra**).

Regarding claims 8-10, **Rees** does not indicate the solvents for the CVD precursor.

**Vaartstra** teaches a CVD precursor composition comprising metalloamides wherein the solvents in which the metalloamide precursor are dissolved to form the CVD precursor are disclosed at col. 8, lines 37-53. More specifically, ethers, amines, hydrocarbons (both aliphatic and aromatic) are disclosed. Further regarding claims 10, note that the C5-C10 aliphatic hydrocarbons are preferred and C8 is octane specifically.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use the solvents of **Vaartstra** as the solvents in the **Rees** CVD precursor composition, because **Vaartstra** teaches that metalloamides are soluble in such solvents for the purpose of CVD. Moreover, it has been held that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. The selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) (Claims to a printing ink comprising a solvent having the vapor pressure characteristics of butyl carbitol so that the ink would not dry at room temperature but would dry quickly upon heating were held invalid over a reference teaching a printing ink made with a different solvent that was nonvolatile at room temperature but highly volatile when heated in view of an article which taught the desired boiling point and vapor pressure characteristics of a solvent for printing inks and a catalog teaching the boiling point and vapor pressure characteristics of butyl carbitol. "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig - saw puzzle." (65 USPQ at 301)).

Regarding claim 16, the prior art of **Rees**, as explained above, discloses each of the claimed features except for indicating multiple metalloamide source reagent compounds.

**Vaartstra** teaches a CVD precursor composition comprising multiple metalloamide source reagent compounds. (See paragraph bridging cols. 6-7.)

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use multiple metalloamides in a CVD precursor of **Rees** to achieve a deposited layer having both metals, as taught to be beneficial in **Vaartstra**.

#### *Response to Arguments*

8. Applicant's arguments filed 4 February 2004 have been fully considered but they are not persuasive.

Applicant argues that **Rees** is directly only to the F-series metals and more specifically does not teach La. Examiner respectfully disagrees. **Rees** provides specific examples of Group II metals such as lithium, Li, and transition metals such as zinc, Zn. Neither Li nor Zn are F-series metals. Accordingly, the argument is not persuasive. Moreover, it is noted that lanthanum, La, is by definition an F-series metal the first of the F-series metals is called the “Lanthanides” or the “Lanthanide series.” **Rees** specifically includes lanthanum, La, as noted in the previous and present Office actions. (See again **Rees** col. 7, Table 1.)

For this reason, Examiner stands by the rejection based upon anticipation stands.

The remainder of the arguments are moot because Applicant has failed to recognize the location in the **Rees** reference --specifically pointed out by Examiner in the previous (and present) Office action that La is specifically disclosed in **Rees**.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin  
Primary Examiner  
8 April 2004